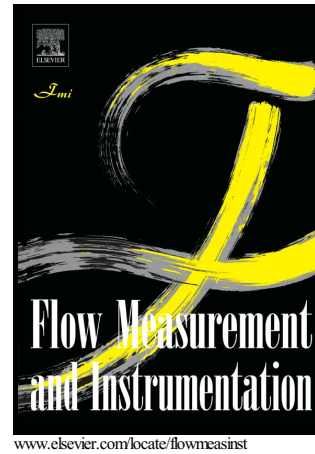


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**Strategies for the applications of flow control downstream of a bluff body**

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**Abstract**

Flow over a bluff body is a common and significant case for engineering sciences. The well-known problem is the highly unsteady and vortical flow structure developing downstream of the body. The wake of the body has a complex flow dynamics. The chaotic flow structure in the wake causes serious structural deformation on the body; hence the flow is intended to be suppressed downstream of the body. There are numerous research papers for this purpose starting from 1960's. The literature survey points out that the investigations may be mainly classified as theoretical or experimental. Furthermore, the control of flow around bodies arranged as side-by-side or tandem was also studied in the past; however the flow control around a single bluff-body is reviewed in this paper. The investigations are currently continuing due to physical importance of the problem and there are increasing number of papers on flow control downstream of a bluff body which is mostly a circular cylinder. In this study, the recent development on the topic is considered such that the main results presented in papers for the last 15 years are reviewed and recalled in detail. The potential future investigation subjects are also discussed by referring to the major contributing solutions in previous related studies reviewed herein.

**Keywords:** flow past a bluff body; active control; passive control; suppression of vortex shedding; drag reduction

**1. Introduction**

Flow past a bluff body has a considerable significance in many engineering applications such as bridges, offshore structures, buildings, cooling towers, petroleum pipelines in cross flow, and heat exchanger tubes. When any bluff body is exposed to the flow of a fluid, the common observed behaviours are *flow separation* and *vortex shedding* in the near wake downstream of the body such as a circular cylinder which was mostly used in the previous investigations

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